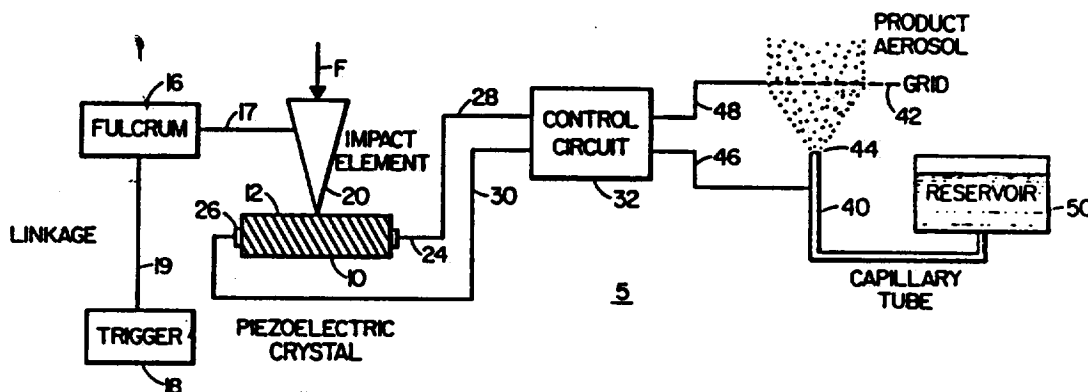


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification 5 :</b> <b>B05B 5/025, 5/053</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 90/03224</b> <b>(43) International Publication Date:</b> <b>5 April 1990 (05.04.90)</b>
<b>(21) International Application Number:</b> PCT/US89/04102 <b>(22) International Filing Date:</b> 20 September 1989 (20.09.89) <b>(30) Priority data:</b> 248,558 23 September 1988 (23.09.88) US <b>(71) Applicant:</b> BATTELLE MEMORIAL INSTITUTE [US/US]; 505 King Avenue, Columbus, OH 43201-2693 (US). <b>(72) Inventors:</b> GREENSPAN, Bernard, J. ; 2337 Enterprise Drive, Richland, WA 99352 (US). MOSS, Owen, R. ; 1129 South Benton, Kennewick, WA 99336 (US). <b>(74) Agents:</b> SHAWEKER, Kenneth, E. et al.; Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201-2693 (US).		<b>(81) Designated States:</b> AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK, FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), NO, SE (European patent).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <div data-bbox="998 819 1218 882"><b>RECEIVED</b> PHILIP MORRIS MANAGEMENT CORP. LAW DEPT-PATENT SECTION</div> <div data-bbox="1006 903 1201 966"><b>MAY 22 1990</b></div> <div data-bbox="1039 945 1477 1071"><i>✓ FILED IN PCT 501102</i> <i>ED: Berman</i></div>

**(54) Title:** NEBULIZER DEVICE**(57) Abstract**

The present invention relates to a portable nebulizer capable of producing a finely divided aerosol having uniformly sized droplets. The nebulizer includes a source of fluid (50) such as a capillary tube (40) coupled to a fluid reservoir (50) to which a high voltage is applied in order to generate the aerosol by electrical atomization. The nebulizer further includes a piezoelectric crystal (10) and a mechanism (16, 17, 18, 19, 20) for deforming the crystal (10) so as to generate the required voltage. By using electrical atomization to generate the aerosol and by piezoelectrically generating the voltage required for atomization, a nebulizer is provided which may be of small size so as to be suitable for hand held operations yet is capable of producing measured amounts of finely divided aerosols which are substantially monodispersed.